

The Canadian Entomologist

LXIV

ORILLIA, JANUARY, 1932

No. 1

PARASITES REARED FROM FOREST INSECTS IN 1929

BY KARL E. SCHEDL,

Entomological Branch, Department of Agriculture, Ottawa, Can.

COLEOPTERA

Scolytus rugulosus Ratz.

Very common in the orchards of the Central Experimental Farm at Ottawa, Ont. Branches of many varieties of apple trees were found infested throughout the summer. In the tunnels frequently were observed specimens of *Salpingus virescens* Lec. (det. W. J. Brown).

Several infested limbs were caged and during the latter part of July, August, and the beginning of September the following parasites emerged:

Eurytoma crassineura Ashm.; *Eurytoma crassineura* Ashm. var.; *Cheiropachus obscuripes* Brues.; *Cheiropachus colon* L.; *Brachistes* sp., (det. Gahan); *Spathius canadensis* Ashm., (det. Cushman).

Phloesinus canadensis Sw.

Several trees of *Thuja occidentalis* which had been transplanted in November 1928, near the city of Ottawa, Ont., were infested by *Phloesinus canadensis* Sw. during the summer of 1929; and many trees of the same species in flooded areas along the Ottawa river were similarly attacked. Material from these localities were caged. From the tunnels were taken *Silvanus bidentatus* Fab. (det. W. J. Brown). The following parasites emerged in August and the first half of September:

Cinetus canadensis Ashm.; *Eurytoma* sp.; *Cheiropachus colon* L.; three species of *Habrocytus*; *Spathius tomici* Ashm. (det. Gahan).

Ips pini Say

Several trees of *Pinus sylvestris* were found infested near the Central Experimental Farm at Ottawa from which the branches were caged in June. Three Coleoptera were found associated with *Ips pini* in the tunnels. These are:

Cylistix cylindrica Payk.; *Nudobius cephalus* Say; *Platysoma coarctatum* Lec., (det. W. J. Brown).

Several parasites obtained by these experiments have not yet been determined.

Ips perotti Sw.

Ips perotti was very common in the Jack Pine stands at Constance Bay near Ottawa, Ont. While no parasites have been obtained by caging a few infested branches, the following two Coleoptera have been found associated with *perotti* in the tunnels:

Hypophloeus parallelus Mels.; *Nudobius cephalus* Say, (det. W. J. Brown).

LEPIDOPTERA

Peronea variana Fern.

Pupae of this common moth in the Maritimes were forwarded by Dr. J. M. Swaine for determining the percentage and kind of parasitism. The pupae were collected at Cape Breton, N. S. The following parasites have been reared:

DIPTERA: *Memorilla maculosa* Mg., (det. Curran).

HYMENOPTERA: *Itopectes leavittii* Cush.; *Itopectes conquisitor* Say; *Apechthis ontario* Cress.; *Epiurus indagator* Cress.; *Phacogenes gaspesianus* Prov.; *Meteorus trachynotus* Vier.; *Phacogenes hariolus* Cress.; *Ascogaster* sp. near *provancheri* D.; *Gelis* sp.; *Epiurus* sp. (det. Cushman).

Ellopia fiscellaria Huebn.

Several shipments of parasite cocoons which were reared from the Hemlock-looper at Stanley Park, B.C., were turned over to the author for further rearing. From these cocoons appeared five species of primary or secondary hymenopterous parasites:

Itopectes montana Cush.; *Mastrus neodiprioni* Vier.; *Mesochorus basalis* Cress.; *Gelis* sp.; *Hyposoter* sp. (det. Cushman).

NOTE ON TWO CANADIAN SPECIES OF EUPITHECIA (GEOM., LEPID.)*

BY J. MCDUNNOUGH,

Ottawa, Ont.

At the time of writing my "Synonymic Notes on Canadian *Eupithecias*" (1929, "Canadian Entomologist", lxi, 49) I omitted, through ignorance of the types, any reference to the following two species. Recently through the kindness of Mr. S. Cassino, in whose collection the types are, I have been permitted to study them and make slides of the genitalia with the following results."

***Eupithecia inclarata* Cass. & Swett**

Eupithecia inclarata Cassino & Swett, 1924, "Lepidopterist", IV, 25.

The unique type is a male from Pocahontas, Alta., June 15, 1917, evidently, by the style of label, collected by Mr. K. Bowman of Edmonton, Alta. The specimen is decidedly rubbed and in consequence the lines bordering the median area stand out rather prominently and there is a suggestion of a slightly darker median band crossing the wing. According to genitalia the species is the same as *obscurior* Hulst (*adornata* Tayl.) and I think the reference to this species may be safely made. The primaries have the same sharply pointed apex, the course of the transverse lines is the same and in the long series before me of *obscurior* from Alberta and British Columbia I have been able to pick out individual specimens which show the same heavier nature of the t. a. and t. p. lines as in the type of *inclarata*.

***Eupithecia divinula* Cass. & Swett**

Eupithecia divinula Cassino & Swett, 1924, "Lepidopterist", IV, 26.

The holotype male, which bears a label "*Eupithecia diversata*" (possibly *err. calami*), was taken at Nordegg, Alta., July 14, 1919, also by Mr. K. Bowman.

It appears to be nothing more than a strongly marked specimen of *dodota* Tayl. which I have already referred to *satyrata* Hbn. I must admit that the cross lines are considerably heavier and more distinct than usual but their course is the same as in *dodota*; in the genitalia the armature of the oedoeagus, consisting of six pieces of chitin, also agrees with that of *dodota*.

*Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

NEW SPECIES OF COLEOPTERA III*

BY W. J. BROWN,
Ottawa, Ont.

The species described below are from several lots of beetles submitted to the author during recent months. Several of the species are of unusual interest, especially the *Phytobius* and the *Trichocellus*. The latter represents a subgenus new to North America and was included in a fine lot of arctic beetles collected by Mr. A. E. Porsild. The collections made in British Columbia by Mr. G. Stace Smith continue to add materially to our knowledge of the beetles of the province.

***Trichocellus porsildi* n. sp.**

Male. Length 3.8 mm.; width 1.5 mm. Body uniformly black throughout; the antennae, mouth parts, and legs very dark brown.

Dorsal parts, except the elytra, similar in form to those of *ruficrus* Kby. Vertex rather finely and moderately closely punctate at base and near the eyes, the punctures bearing a few very inconspicuous, brownish-yellow hairs. Pronotum with the basal foveae and median line impressed as in *ruficrus*; the disk rather finely punctate, the punctures close near the margins, bearing a few inconspicuous hairs like those of the head, a moderately large median area almost impunctate.

Elytra similar in general form to those of *ruficrus* but more convex; the suture slightly but distinctly elevated except at the extreme base; the striae a little less fine than in *ruficrus*; the intervals flat, each with a slightly irregular row of rather coarse punctures, the punctures varying slightly in size but all very distinct and a little larger than those of the pronotum, the punctures of the lateral intervals neither larger nor more numerous; each puncture bearing a suberect, brownish-yellow hair which is about as long as half the width of an interval, these hairs much more conspicuous than those of the pronotum; the usual setigerous puncture of each elytron not evident. Inner wings apparently absent, if present very much reduced.

Abdomen very finely punctate throughout, the apical segment more closely so, the punctures more distinct than in *ruficrus*; the modification at middle of the combined basal segments of a different type, this area without special pubescence but with two well separated, very small foveae on the median line. All the tarsi stouter than in *ruficrus*, the four basal segments of the anterior pair distinctly transverse.

Holotype—♂, Baker Lake, N. W. T., September 6, 1930; (A. E. Porsild); No. 3249 in the Canadian National Collection, Ottawa.

Paratype—1 ♂, same data.

The paratype measures 3.5 mm. The species is very readily distinguished from our other species by its small size, dark color, and elytral puncturation, and is closely allied to none of them. The present species is a member of the subgenus *Oreoxenus* Tschitsch. and is therefore allied to the European species *mannerheimi* Sahlbg. and *oreophilus* Dan. Certainly *ruficrus* Kby., and probably our other North American species, belong in *Trichocellus* s. str.

*Contribution from the Division of Systematic Entomology, Entomological Branch, Dept. of Agric., Ottawa.

Careful study has failed to reveal the usual setigerous elytral punctures in *porsildi*. If these exist, they are not attached to the second striae as in *ruficus* and are obscured by the general puncturation, the setae being lost in the type specimens. The very small setigerous puncture at the base of the second stria is evident in *porsildi* as in *ruficus*.

***Hydroporus compertus* n. sp.**

Length 3.5 mm.; width 1.7 mm. Feebly ovate, widest just before the middle; depressed. Head reddish-brown, paler anteriorly; pronotum black, the sides rather broadly reddish yellow; elytra dark brown, becoming slightly but distinctly paler at base; metasternum, coxal plates, and abdomen black; antenna yellow, the terminal segment darker; legs yellow, not infusate. Body moderately shining.

Head seven-tenths as wide as the pronotum, finely alutaceous, sparsely and microscopically punctulate. Width of pronotal base nine-tenths as great as the greatest width of the elytra; the pronotum indistinctly alutaceous; the punctures very fine and sparse at middle, less so near the base; the bead of the side margins narrow. Elytra widest at basal third; indistinctly alutaceous; finely and not closely punctate.

Metasternum closely and coarsely punctate on the sides. Coxal plates indistinctly alutaceous, finely and rather closely punctate. Abdomen not alutaceous, finely and rather closely punctate on the sides in basal half; elsewhere with sparse microscopic punctules. Anterior tarsi moderately dilated, the segments of equal width; the middle tarsi narrower. Sexual characters not apparent.

Holotype—Copper Mountain, B. C., June 15, 1930, (G. Stace Smith); No. 3241 in the Canadian National Collection, Ottawa.

Paratypes—8, same data, June 15 and July 13, 20, and 23, 1930.

The paratypes measure from 3.25 to 3.5 mm. and show some variation in sculpture. In some specimens, the elytral punctures are a little closer and the alutaceous sculpture of the dorsum is more distinct. There is little variation in color. In one specimen, the antennae are feebly infusate in apical half, and in all the elytra are a little paler at base as described above.

The species is a member of the *vilis* group and is closely allied to *planiusculus* Fall with which it agrees well in body form. In *planiusculus* the size is smaller; the color is paler, and the elytra are more sparsely punctate. In *vilis* Lec., body is more strongly ovate and more convex, and the elytra are much more finely punctate than in the present species. In *brumalis* Brown, the elytra are much paler and more closely punctured, and the body is less narrowed anteriorly.

***Agabus verisimilis* n. sp.**

Male. Length 7.5 mm.; width 3.7 mm. Oblong oval, the sides almost parallel. Black; antennae and palpi rufous, not infusate; two spots on the vertex and labrum rufous; pronotum with the side margins narrowly and very distinctly rufous; elytra without pale spots; tibiae and tarsi rufous, the hind tibiae darker; femora black, their extremities rufous.

Sculpture of pronotum and elytra exactly as in *confertus*; the surface very finely reticulate, the meshes irregular and moderately large; the pronotum

without a secondary reticulate sculpture, with very few minute punctules situated within the meshes; the elytra with a secondary micro-reticulate sculpture within the meshes, with numerous and conspicuous minute punctules situated for the most part at the intersections of the reticulating lines. Pronotum with the lateral marginal bead very fine; the basal margin feebly oblique near the hind angles, the latter therefore obtuse. Elytra subparallel.

Prosternal process short and rather wide, angulate and roof-shaped in cross section. Metasternal sulcus rudimentary but better developed than in *confertus*, deeper and wider as in *kenaiensis*. Shortest distance between the meso-coxal cavity and the meta-coxal plate exactly three-fifths the length of the latter. Hind tibiae with one or two coarse punctures along the inner margin, these not basal, the tibiae with numerous discal punctures at base.

Male characters: pro- and mesotarsi quite narrowly dilated, the fourth segments about three-fourths as wide as the first segments, without distinct palettes. Protarsal claws equal, the anterior as in the female, the posterior quite feebly but distinctly sinuate on the inner margin. Last ventral segment feebly flattened at middle, very feebly strigose externally in apical half.

Female. Secondary reticulate sculpture more distinct. Last ventral segment not distinctly flattened, not strigose; females evidently not dimorphic.

Holotype—♂, Creston, B. C., April 21, 1930, (G. Stace Smith); No. 3237 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

Paratypes—21 ♂, 7 ♀, same data, April 18 and 21, 1930; 9 ♂, 18 ♀, same data, April 13, 1931.

The paratypes are quite constant in size and show little variation in other characters. In some males, the last ventral is not flattened at middle. The number of punctures long the inner margin of the hind tibiae varies to four or five. The species is closely allied to *confertus* Lec., *gelidus* Fall, and *kenaiensis* Fall. The male tarsi of the present species are very feebly modified; in this respect and in the form of the metasternal sulcus it resembles *kenaiensis*. In the more obtuse posterior pronotal angles and long metasternal wings, it agrees best with *confertus*. The lateral marginal bead of the pronotum is finer and the pale lateral margins of the pronotum are more conspicuous than in any of the allied species. The present species may be separated from *gelidus* and *kenaiensis* by its long metasternal wings and from *confertus* by its smaller size, more parallel form, immaculate elytra, and feebly modified male tarsal claws and last ventral segment.

***Limnebius columbianus* n. sp.**

Male. Length 1.66 mm.; width .83 mm. Narrowly oval, widened anteriorly, moderately convex. Black; legs and palpi scarcely paler; body moderately shining; pubescence of dorsum brownish-yellow, long, very fine, and very sparse.

Head three-fifths as wide as the pronotum; front and clypeus closely and very finely reticulate, rather sparsely and microscopically punctulate, the punctures not very evident and less so at middle; clypeus with a punctiform fovea on each side, this situated at lateral fourth and midway between the apical and basal margins; labrum very finely but more distinctly punctulate;

last segment of maxillary palpus narrowly fusiform.

Pronotum twice as wide as long, widest at base, the sides strongly converging and moderately arcuate to apex; the basal margin straight. Disk at middle reticulate and punctulate like the front, on the sides similar but with the reticulation more strongly impressed; with a transverse series of dense, distinct punctures on each side near anterior margin; a rather large, feeble depression on each side at basal third; a basal punctiform fovea on each side near the scutellar angles. Scutellum distinctly wider than long.

Elytra with the side margins continuous with those of the pronotum, moderately converging and feebly arcuate posteriorly; the disk impunctate, reticulate like the pronotum, the reticulation very feebly impressed posteriorly where the surface is more strongly shining; without trace of a sutural stria; the apices rather broadly rounded.

Metasternum and abdomen very finely, densely, and very distinctly punctate, feebly shining, with close conspicuous pubescence; the sixth and seventh abdominal segments polished, almost without sculpture and pubescence.

Male characters: elytra not covering the pygidium, not attenuate, the side margin strongly arcuate at the apex, the apex transversely rounded. Sixth ventral segment as long as the fourth and fifth combined, with a rather large, shallow, but very distinct median depression; the posterior margin elevated at middle to form a low, feeble tubercle, a few moderately long hairs between the depression and the posterior margin of the segment. Seventh ventral transversely impressed at base. Pygidium with two very long, slender brushes of hairs at apex, these brushes moderately separated.

Female. Elytra more prolonged, covering the pygidium, the side margin only moderately arcuate at apex, the apex obliquely subtruncate. Sixth ventral segment two-thirds as long as the fifth, not modified. Seventh ventral not modified. Brushes of pygidial apex not separate, appearing as a single brush.

Holotype—♂, Similkameen River, Copper Mt., B. C., October 30, 1930, (G. Stace Smith); No. 3233 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

Paratypes—13 ♂, 12 ♀, same data, August 24, September 21, and October 30, 1930; 6 ♂, 5 ♀, Wolfe Creek, Copper Mt., B. C., March 28, June 1, and July 12 and 20, 1930, (G. Stace Smith).

The pygidial brushes described above are probably the "terminal setae" of Casey. These brushes usually look like solid setae, but in reality each is composed of several slender, very close set hairs. The present species is allied to *piceus* Horn. The blackish legs and palpi and the structure of the male sixth ventral are characters worthy of special note.

***Hydnobius simulator* n. sp.**

Male. Length 3.7 mm.; width 1.6 mm. Elongate, parallel, rather feebly convex. Rufo-piceous, the antennal club and venter blackish; strongly shining.

Head two-thirds as wide as the pronotum; finely punctate, the front closely so; occiput limited anteriorly by a feebly impressed line, sparsely punctate; the front distinctly margined and not emarginate behind the labrum; the clypeus exposed; the labrum broadly emarginate; the mandibles very promin-

ent. Third antennal segment twice as long as the second, as long as the fourth and fifth together; the antennal club slender.

Pronotal length equal to three-fourths the width, the pronotum widest at basal two-fifths, the sides rather feebly converging and without trace of sinuation anteriorly, converging more strongly posteriorly; anterior angles slightly obtuse, quite broadly rounded; hind angles very obtuse but distinct and scarcely rounded; the entire margin with a continuous, distinctly impressed marginal line. Disk finely punctate, the punctures regularly distributed and separated by about twice their diameters; a small, transverse, impression on each side near the base.

Elytra very slightly wider than the prothorax; the sides subparallel and feebly arcuate; striae except the sutural feebly impressed; each with a row of closely placed, rather fine punctures; intervals almost flat, punctate and with very feeble traces of transverse rugae, the punctures finer than those of the striae, confused on the first and second intervals, arranged in a single irregular row on each of the others.

Middle and hind femora and metasternum closely and rather coarsely punctate. Abdomen strongly alutaceous, each segment finely punctate near the apex. Femora not toothed; tibiae straight.

Male characters: anterior femur stouter, parallel. Anterior tibia widest at middle, the outer margin straight, the inner margin straight in apical half and almost so basally; the larger spur inserted at the widest point on the inner margin, the insertion equidistant from base and apex, the spur very long, attaining the apex of the third tarsal segment, very narrow and broadly bent inwardly at middle when viewed from the front, very wide, subparallel, and bluntly pointed when viewed from the side. Anterior and middle tarsi distinctly dilated. Hind margin of posterior femur more strongly canaliculate. Punctures of elytral intervals finer, the intervals with moderately close, microscopic punctules throughout.

Female. Anterior femur more slender, the sides not parallel; anterior tibia normal, widest and truncate at apex; the larger spur inserted at apex, attaining the apex of the second segment, cylindrical and normal. Elytral intervals less finely punctate, without microscopic punctules.

Holotype—♂, Creston, B. C., Nov. 19, 1930, (G. Stace Smith); No. 3281 in the Canadian National Collection, Ottawa.

Allotype—♀, same data.

Paratypes—2 ♂, 2 ♀, same data; 1 ♂, 2 ♀, same data, Nov. 17, 1930.

The paratypes measure from 3.3 to 4 mm. in length. Two of them are paler than the type, being dark reddish-brown above. The species is very closely allied to *matthewsii* Crotch, and may be confused with the latter in collections. The allied species is larger and paler in color than *simulator*, and is readily distinguished by the sexual characters and by characters of the front. In *matthewsii* the front is unmargined and broadly emarginate behind the labrum, the antennal club is much stouter in the female than in the male, and the anterior tibia is of normal form in both sexes.

Morychus albertanus n. sp.

Length 4.5 mm.; width 2.7 mm. Broad, slightly ovate, moderately convex. Dorsal surface greenish and polished, without cupreous lustre; ventral surface and legs dark brown, moderately shining, the tarsi not paler; antennae black.

Vestiture plentiful but not dense, very conspicuous, recumbent throughout except on the elytra near apex where it is inclined. Hairs of the head white and brownish-yellow, the former more conspicuous; very sparse at middle of vertex, elsewhere rather close. Hairs of the pronotum similarly long and rather coarse and close, not concealing the sculpture; the hairs of the apical two-fifths except on the median line and the hairs over an equally broad area along each side margin largely white; the disk elsewhere with brown hairs and without white hairs except on a small basal area on each side. Scutellum concealed by dense white hairs. Hairs of the elytra white and brownish-yellow, the former more abundant over the basal three-fifths and the latter over the apical two-fifths, the hairs close as on the pronotum; each elytron with two spots composed of dark brown hairs; the anterior spot transverse and very slightly oblique, about one-half wider than long, extending from a point behind the humeral umbone to a point near the suture; the posterior spot oval, sublateral, rather narrowly separated from the anterior; these spots not sharply defined but very distinct. Vestiture of the ventral surface and legs finer, whitish and uniform, very close, almost concealing the sculpture.

Sixth antennal segment about as long as wide, the seventh slightly transverse. Head not foveate, very sparsely punctate at middle of vertex, elsewhere with moderately close punctures. Pronotum and elytra similarly punctate, the punctures moderately fine and close, a little less close at middle. Elytra widest at middle, feebly converging and scarcely arcuate anteriorly. Tarsi not distinctly lobed.

Holotype—Crow's Nest Pass, Alta., June 7, 1930, (J. H. Pepper); No. 3246 in the Canadian National Collection, Ottawa.

Paratypes—3, same data, June 6 and 7, 1930.

The paratypes measure from 4 mm. to 4.7 mm. in length; otherwise they show little variation. The species belongs with *aeneolus* Lec., *subsetosus* Fall, and *lateralis* Fall, and is probably most closely allied to *lateralis*. It should be recognized by the characters of the vestiture. Compared with *oblongus* Lec., the present species is shorter, and has a less convex pronotum, different color, different type of vestiture, and finer puncturation.

Simplocaria remota n. sp.

Female. Length 3.8 mm.; width 1.9 mm. Elongate oval. Dorsal surface very dark green; ventral surface black; the legs and antennae very dark brown; the body polished.

Antennal club of five segments. Head and pronotum moderately closely, very finely and very indistinctly punctate. Pronotal length equal to four-sevenths the width. Elytra widest at middle; the pubescence reddish-brown and variegated with small silvery patches; the striae of the usual type but strongly impressed throughout, scarcely more strongly impressed at base than at apex and on the sides.

Metasternum rather closely punctate, the punctures very fine and indistinct. Abdomen finely and densely punctate. Elytral epipleura gradually disappearing near the hind coxae. Hind tarsi almost as long as the hind tibiae.

Holotype—♀, Kazan River, N. W. T.; latitude 63° 1', August 19, 1930; (A. E. Porsild); No. 3248 in the Canadian National Collection, Ottawa.

Paratype—1 ♀, same data.

This species may be distinguished from *tessellata* Lec. by its large size; elongate form, and strongly impressed elytral striae. The silvery spots of the elytral pubescence are smaller and less conspicuous in *remota*; this may be due to the condition of the specimens. In *tessellata*, the pronotum is twice as wide as long, and puncturation of the head and pronotum is more distinct.

***Ernobius schedli* n. sp.**

Male. Length 4 mm.; width 1.5 mm. Elongate, parallel. Black, the elytra very dark brown, the antennae brown, the mouth parts and tarsi brownish-yellow; pubescence recumbent, short.

Head very finely and densely granulate. Pronotum finely and densely granulate, the granules better defined except at base and larger than those of the head; the pronotum widest before the posterior angles, these very obtuse and very broadly rounded, the sides moderately arcuate; the anterior angles obtuse and rounded but much more distinct; the lateral declivities feebly and very indistinctly impressed near middle. Elytra fully twice as long as wide, finely and closely punctate, feebly granulate at base.

Prosternum quite short before the coxae. Metasternum finely and densely punctate on the sides, closely so at middle, the median line sulcate in caudal two-fifths. Abdomen very finely and densely punctate, feebly shining.

Male characters: eyes very prominent. Antennae equal in length to the elytra; the second, third, and fourth segments equal in length, the sixth one-half longer, the fifth very slightly longer than the sixth and equal to the eighth, the seventh very slightly longer, the ninth very slightly longer than the three preceding united. Pronotal length equal to six-tenths the width, the disk a little less convex, the sides broadly and strongly explanate. Metasternum strongly flattened at middle. Fifth abdominal segment with a strong, transverse impression before the apex; the sixth segment with its apex rounded and entire. Legs very long.

Female. Eyes less prominent. Antennae distinctly shorter than the elytra; segments two, three, four, six, and eight subequal, five and seven a little longer, segment nine slightly shorter than the three preceding united. Pronotal length equal to seven-tenths the width, the disk a little more convex, the sides broadly but not strongly explanate. Metasternum very feebly flattened at middle. Fifth abdominal segment not impressed; the sixth with a small emargination at apex. Legs less elongate.

Holotype—♂, Biscotasing, Ont., June 21, 1930, (K. E. Schedl), No. 3232 in the Canadian National Collection, Ottawa.

Allotype—♀, same data, without date.

Paratypes—5 ♂, 6 ♀, same data.

The species shows some variation. All of the males and two of the females are colored like the holotype. The allotype and the other females are

reddish-yellow with the ventral parts somewhat darker. In one of the female paratypes, antennal segments two to eight inclusive are subequal in length. Among the other females, there is a little variation in these segments, but in most, segments five and seven are one-half longer than the others. In some of the specimens, the granules of the pronotum are less distinct near the base than in others, and in the largest specimen, a dark female, the pronotum is not granulate but punctate in basal third. The paratypes vary between 3.7 mm. and 4.8 mm. in length.

The females of *schedli* fall with *mollis* L. in Mr. Fall's table but have the ninth antennal segment relatively longer than the latter species. The males resemble the males of *palitarsis* Fall in color and present notable characters in the pronotal form and elongate appendages. They emerge in the table near *collaris* Fall but may be known by the antennal characters.

***Ataenius abditus exiguus* n. subsp.**

Length of holotype 3 mm.; width 1.2 mm.; length of paratypes 2.7-3.2 mm. Dorsum black, the elytra in one paratype reddish-brown. Head with a rounded area at middle virtually impunctate, this area occupying fully one-fourth of the disk. Pronotum micro-reticulate, a little less strongly shining than in typical *abditus*. Other characters as in typical *abditus*.

Holotype—Homestead, Fla., June, 1929, (P. J. Darlington, Jr.); in the Museum of Comparative Zoology.

Paratypes—11, same data; No. 3288 in the Canadian National Collection, Ottawa.

The paratypes show little variation except that noted above. The micro-reticulate sculpture mentioned above and in the following notes is visible only with high magnification; the dull lustre it produces is more readily observed. The present subspecies may be compared with its allies as follows:

1. Color darker; the elytra usually black, micro-reticulate and less strongly shining, the intervalles less finely punctate and more strongly crenate...2
- Color paler; the elytra reddish-brown, polished and not micro-reticulate, the intervals more finely punctate and less strongly crenate; head very finely punctate at middle; length 3.3-4 mm. *abditus texanus* Harold
2. Length 3.3-4 mm.; head very finely punctate at middle; pronotum not micro-reticulate, strongly shining *abditus abditus* Hald.
- Length 2.7-3.2 mm.; head with a large median area virtually impunctate; pronotum micro-reticulate and less strongly shining *abditus exiguus* n. subsp.

As defined above, *texanus* includes all the material before me, over sixty specimens, from Kansas, Oklahoma, Texas, and California. In some specimens, the pronotal punctures are much finer anteriorly than posteriorly. This character is subject to considerable variation; the characters given above are quite constant and seem to indicate that *texanus* is a well defined subspecies. Typical *abditus* was described from the "Middle States" and is represented in the collection at hand by twelve specimens from French Lake, N. B., Pt. Pelee, Ont., New Hampshire, and South Carolina.

***Phytobius albertanus* n. sp.**

Female. Length 2.8 mm.; width 1.45 mm. Form and structure as in *velatus* Beck; color of vestiture as in *griseomicans* Sz. Color black; the an-

tennae and legs pale reddish-yellow, the antennal club and tarsi a little darker, the extreme apices of the femora black. Vestiture of dorsum composed of small, circular, opaque, slate-colored scales which form a dense waterproof covering and a few patches of whitish scales; the scales of the sides and venter a little larger and less dense, whitish; the scales of the legs whitish and quite small, rather dense, those of the tibiae more elongate.

Beak as long as the head, almost straight, very feebly widened at apex; with dense scales, those of the upper surface small and grey, those of the underside larger and whitish. Head with dense scales similar to those of the beak; the front flattened but not concave between the eyes, the vertex with a fine carina.

Pronotum almost as long as wide, widest at apical two-fifths; the sides almost straight and strongly converging anteriorly, subparallel posteriorly; the apical margin without cusps; the apical constriction feeble but distinct; the median channel and lateral tubercles obsolete; a rather large, feeble depression on each side of disk at middle; these depressions, the apical constriction, and the median line with whitish scales; sculpture obscured by the scales but evidently consisting of dense punctures. Mesosternal side pieces visible from above between the prothorax and the elytra. $\frac{1}{2}$ δ

Elytra much wider at base than the pronotum, widest just behind the humeri; striae moderately wide and deep; intervals convex, their sculpture obscured by the scales, the third and fifth not elevated at base but similar to the others; a small but conspicuous post-scutellar spot of white scales, the scales on the sides beyond the humeri whitish.

Tarsi with long, sparse swimming hairs. Tibial apices unarmed.

Holotype—♀, Waterton Lakes, Alta., July 2, 1930, (J. H. Pepper); No. 3253 in the Canadian National Collection, Ottawa.

This species and *velatus* are so closely allied that no differences in form or structure are evident to me. Because of its larger size and the color and nature of its vestiture however, the present species may be confused with *griseomicans*. It is probable that the male of *albertanus* has the middle tibiae unguiculate like that sex of the other species.

Some of the published statements regarding these species are misleading; the mesoternal side pieces are visible from above in *velatus*. The subgenera of *Phytobius* are not correctly recorded in Leng's Catalog. As far as I can determine from the literature at hand, *Euhrychiopsis* Dietz is a synonym of *Eubrychius* Thoms., *lecontei* Dietz on which the former is based being a synonym of *velatus* according to Blatchley and Leng. Then *griseomicans* Sz. is better placed in *Litodactylus* Redtenb. as it is evidently quite closely allied to the European *leucogaster* Marsh. Some European authors give *Litodactylus* generic standing and include *Eubrychius* with it as a subgenus. The more typical species of *Phytobius* seem to be placed by American authors in *Peleonomus*, a genus considered synonymous with *Phytobius* by European authors.

The three American species discussed above may be separated by the following table: $\frac{1}{2}$ δ

1. Tarsi without swimming hairs; lateral tubercles of pronotum large and acute; fifth elytral intervals strongly elevated at base (*Litodactylus*)

-*griscomicans* Sz.
Tarsi with long, sparse swimming hairs; pronotal tubercles obsolete; fifth elytral intervals not elevated (*Eubrychius*).....2
2. Scales of the dorsum greenish-yellow, no white scutellar spot; length 2-24 mm.*velatus* Back.
Scales of the dorsum slate-colored, a post-scutellar spot of white scales; length 2.8 mm.*albertanus* n. sp.

SOME ERYTHRONEURA (GRAPE LEAF HOPPERS) OF THE
MACULATA GROUP. (HOMOPTERA CICADELLIDAE)

BY R. H. BEAMER

Department of Entomology, University of Kansas, Lawrence, Kansas.

(continued from page 289)

34. *Erythroneura separata* n. sp.

General ground color yellowish white to semihyaline, markings red or orange. Vertex with semblance of three white spots more or less surrounded with red or orange bands. Pronotum with rather short triangular median spot, not touching either margin. Usual angular spot back of each eye. Scutellum with tip red, basal angles yellow outlined on two sides with red. Clavi with usual basal anchor-shaped mark and angular mark before tip. Coria with spot on costa midway between costal plaque and humeral angle, angulate vitta at anterior end of plaque, rectangular spot opposite middle of plaque, two spots at posterior end and blotch before base of cell M_4 . Cross-veins red. Black spot in base of cell M_4 . Tips of tegmen more or less dusky. Venter stramineous more or less tinged with pink.

Genitalia. Pygofer hook double, not extending beyond end of pygofer, outer portion almost straight, inner portion arises near base diverges sharply for short distance then proceeds almost parallel to outer, ending just short of its tip. Style with medium foot; base straight; heel medium; anterior point about a right angle, short and sharp; posterior point almost as long as toe is wide, very narrow and sharp. Oedagus of medium length, slightly curved dorsally near end of widened portion this being at least as wide again as shaft.

Holotype; male, Anderson Co., Kans., Nov. 26, 1927, R. H. Beamer.

Paratypes; 11 males from Kansas, Iowa and Illinois.

The species is easily separated from all others by the shape and form of the pygofer hook.

35. *Erythroneura firma* n. sp.

General ground color yellowish white to semihyaline marked with red. Vertex with semblance of three white spots more or less surrounded with red. Pronotum with rather small triangular spot not reaching either margin and usual angular mark back of each eye. Scutellum with tip red, basal angles yellow. Clavi with basal anchor-shaped red mark, middle portion of which is very narrow, another semicircular spot just before tip. Coria with spot midway between costal plaque and humeral angle, one at anterior end of plaque, rectangular spot on disc opposite middle of plaque, triangular blotch before base of cell M_4 , veins R and M_1 from plaque to cross-veins red and portion of cross-veins red. Tips of tegmen more or less dusky. Rather large black spot in base of cell M_4 and smaller one in posterior end of plaque. Face with broken red

cross-band almost connected with red apical spot of vertex. Venter stramineous with pink.

Genitalia. Pygofer hook single, of medium length, bifid at tip, inner point of which is flattened out into flange-like process which ends in very sharp point. Style with medium foot; base almost straight; heel medium; anterior point short, slightly less than right angle; posterior point about as long as toe is wide, outer margin straight, inner curving to meet base of foot. Oedagus of medium length, straight, cylindrical.

Holotype; male, Anderson Co., Kansas, Sept. 9, 1927, R. H. Beamer.

Paratypes; eight specimens, Kansas, Illinois and Maryland.

This species is characterized by the widened flange-like process of the pygofer hook.

36. *Erythroneura propria* n. sp.

General ground color yellowish-white to semihyaline marked with red or orange. Vertex with semblance of three white spots more or less surrounded by bands of color. Pronotum with median Y-shaped mark, touching each margin, arms of Y almost parallel, usual angular mark back of each eye. Scutellum with red spot on tip, basal angles yellow with tinge of color on each outer margin. Clavi with rather heavy basal anchor-shaped spot and rectangular spot before tip. Coria with angulate vitta on costa midway between costal plaque and humeral angle, another more or less connected, irregular-sided, zigzag vitta arising at anterior end of plaque, almost surrounding it, reaching almost to claval suture opposite middle of plaque and ending in enlarged portion at base of cell M_4 . Cross-veins red. Tips of tegmina more or less dusky. Black spot in posterior end of plaque and base of cell M_4 . Face with narrow red angular cross-band. Venter stramineous.

Genitalia. Pygofer hook single, long, twice as wide on middle third as near base, slightly incurved in this portion. Style with short foot; base curved; heel small; anterior point short, sharp, less than a right angle; almost no posterior point, about a right angle. Oedagus long, straight in any view, cylindrical, larger around than average, ending in evenly rounded tip.

Holotype; male, Leavenworth Co., Kans., April 28, 1928, R. H. Beamer.

Allotype; female, Lacoochee, Fla., Aug. 18, 1930, R. H. Beamer.

Paratypes; numerous specimens of both sexes from Kansas, Florida, Maryland and Louisiana.

37. *Erythroneura dumosa* n. sp.

General ground color yellowish white to semihyaline marked with red. Vertex with semblance of three white spots surrounded with red bands. Pronotum with median Y-shaped mark, touching each margin and angular spot back of each eye but longer than usual reaching at least half way to posterior border. Scutellum with spot on tip, basal angles yellow more or less margined with red. Clavi with heavy basal anchor-shaped mark, touching mesal margin and claval suture, rather long spot just before tip. Coria with angulate dash on costa midway between plaque and humeral angle reaching to claval suture, an irregular sided, zigzag vitta arising at anterior end of plaque, surrounding it, enlarged to touch claval suture opposite middle of plaque and ending in another enlarged section at base of cell M_4 . Cross-veins red. Tips of tegmina

more or less dusky. Black spot in base of cell M_4 and in posterior end of plaque. Venter stramineous with narrow red angulate, cross-band on face.

Genitalia. Pygofer hook single, of medium length, narrowed in middle, sharply swollen just before tip, evenly curved into swollen area where it turns suddenly out. Style with medium foot; base straight; heel small; anterior point short, about a right angle; posterior point as long as toe is wide, narrow, slightly curved in. Oedagus short, dorsal margin slightly longer, more or less spiny on outer half.

Holotype; male, Johnson Co., Ill., March 3, 1929, R. H. Beamer.

Paratypes; seven specimens from Illinois, Oklahoma, Arkansas and Iowa.

This species is separated from those close to it by the male genitalia.

38. *Erythroneura solita* n. sp.

General ground color yellowish white to semihyaline marked with red. Vertex with semblance of three white spots surrounded with red bands. Pronotum with rather shield-shaped median spot usually not touching either margin although semblance of red vitta may project anteriorly from outer corners, usual red angular spot back of each eye. Scutellum with tip red, basal angles yellow with red dash in each outer corner. Clavi with usual basal red, anchor-shaped mark, rather narrow, and irregular red blotch just before tip. Coria with spot on costa midway between costal plaque and humeral angle, angulate, irregular-sided, more or less connected vitta arising at anterior end of plaque, surrounding it and ending in enlarged area at base of cell M_4 . Cross-veins red. Tips of tegmina more or less dusky. Small black spot in posterior end of plaque and larger one in base of cell M_4 . Red V-shaped cross-band on face, more or less connected to anterior spot on vertex and with eyes. Venter stramineous.

Genitalia. Pygofer hook single, of medium length, wider at base than any other point, with very slight S-curve. Style with short foot; base evenly curved; heel medium; anterior point very short, about a right angle; posterior point as long or longer than toe is wide, inner margin forming smooth curve with base of foot. Oedagus short, almost straight, slightly wider in outer third, ends in rounded tip, base in lateral view forms a rather heavy tooth just above base of shaft.

Holotype; male, Lawrence Co., Ill., March 31, 1929, R. H. Beamer.

Paratypes; 6 specimens, Ill., 1929.

39. *Erythroneura usitata* n. sp.

General ground color semihyaline to white tinged with yellow. Color red or orange. Vertex with semblance of three white spots more or less surrounded with red bands. Pronotum with narrow median U or semicircular mark and usual angular mark back of each eye. Scutellum with tip red, basal angles yellow more or less outlined with red on two sides. Clavi with usual anchor-shaped mark in basal half and small irregular spot before tip. Coria with spot on costa midway between plaque and humeral angle, angular vitta at anterior end of plaque, one opposite middle of plaque and three longitudinal dashes, first at posterior end of plaque, second on M_1 and third before base of cell M_4 , each successively longer in order named. Small black spot in posterior

end of plaque, larger one in base of cell M_4 . Cross-veins red. Tips of tegmina more or less dusky. Venter stramineous tinged with pink.

Genitalia. Pygofer hook single, enlarging evenly to middle then slowly decreasing in width to tip, often toothed on inner margin. Style with large foot; narrow toe; base straight on inner two thirds; anterior point less than right angle, very short, projecting out; posterior point longer than foot, narrow, almost parallel-sided, somewhat curved, projecting at right angles to base. Oedagus straight in lateral view, widened in dorsal view with teeth on lateral margins.

Holotype; male, Johnson Co., Ill., March 3, 1929, R. H. Beamer.

Paratypes; numerous specimens, from Illinois, Maryland and Washington, D.C.

This species resembles *E. bella* McA. in its inner male genitalia but differs from that species in not having almost solid red exterior markings.

40. *Erythroneura macra* n. sp.

General ground-color semihyaline to yellowish white marked with red. Pronotum with semblance of three white spots more or less surrounded with red bands. Pronotum with rather irregular median red spot not reaching either margin. Usual angular mark back of each eye, rather small. Scutellum with spot at tip, basal angles yellow with small amount of red in corner. Clavi with semblance of anchor-shaped mark in base, rectangular spot before tip. Coria with spot on costa midway between plaque and base, an irregular-sided vitta arising at anterior end of plaque and ending near claval suture opposite outer claval spot, and third vitta arising at posterior end of plaque and ending in enlarged portion just before base of cell M_4 . Cross-veins more or less red with red blotches along them. Very small black spot in posterior end of costal plaque, larger one in base of cell M_4 . Tips of tegmina more or less dusky. Venter stramineous, legs more or less tinged with pink.

Genitalia. Pygofer hook single, tapering from base to tip, with slight S-curve, outer third rather sharply bent out. Style with medium foot; base almost straight; heel large; anterior point very short, almost right angle; posterior point two-thirds as long as foot, narrow, forming almost right angle with base. Oedagus quite short, straight, slightly tapering to tip, short spines on outer half.

Holotype; male, Johnson Co., Ill., March 3, 1929, R. H. Beamer.

Paratypes from Illinois and Maryland.

41. *Erythroneura sancta* n. sp.

General ground color semihyaline to yellowish white marked with red. Vertex with semblance of three white spots more or less surrounded with red bands. Pronotum with small median red spot not touching either margin but sometimes with semblance of projections on anterior corners, usual angular mark back of each eye. Scutellum with tip red, basal angles yellow, small angular spot of red in each outer corner. Clavi with usual basal anchor mark and rectangular spot before tip. Coria with spot on costa midway between plaque and humeral angle, an irregular-sided more or less connected zigzag vitta arising on costa at anterior end of plaque surrounding it and ending just before base of M_4 . Cross-veins heavily marked with red. Small black spot in base

of cell M_4 but usual one in posterior end of plaque lacking. Tips of tegmina more or less dusky. Venter stramineous with legs more or less tinged with pink.

Genitalia. Pygofer hook single, of medium length, with very slight S-curve, widest at base, outer third about one-third as wide as base. Style with foot small; narrow throughout; heel small; anterior point short, about right angle; posterior point as long as foot, extending at right angles to it, about as wide at its base as foot, sides evenly converging. Oedagus short, dorsoventrally flattened, widest just before tip, lateral margin of outer fourth sharply toothed, tip truncate, shaft in lateral view slightly curved dorsally.

Holotype; male, Johnson Co., Ill., March 3, 10, 1929, P. W. Oman.

Allotype, female and ten *paratypes* from same locality.

42. *Erythroneura incondita* n. sp.

General ground color semihyaline to yellowish white marked with orange spots. Vertex with semblance of three white spots more or less surrounded with orange bands. Pronotum with median V-shaped spot often touching either margin, usual angular spot back of each eye. Clavi with semblance of anchor-shaped spot in base often only an orange blotch, and an irregular blotch just before tip. Coria with very small spot on costa midway between plaque and humeral angle, small dash at anterior end of plaque, larger spot opposite middle of plaque, and series of blotches from posterior end of plaque to base of cell M_4 . Cross-veins more or less red. Black spot in base of cell M_4 . Tips of tegmina more or less dusky. Venter stramineous, legs tinged with pink.

Genitalia. Pygofer hook single, very long and crooked, very narrow just before base, immediately thereafter three times as wide, slightly S-curved. Style long; foot small; base curved; heel large; almost no anterior point, about right angle; posterior point as long or longer than foot, narrow, forming about a right angle with foot. Oedagus short, almost straight, cylindrical, few very short spines on outer third.

Holotype; male, Johnson Co., Ill., March 30, 1929, R. H. Beamer.

Paratypes; 5 males, Johnson Co., Ill., March 30, 1929, Beamer and Oman.

43. *Erythroneura immota* n. sp.

General ground color semihyaline to yellowish white marked with orange. Vertex with median longitudinal orange stripe with enclosed white mark and an angulate mark at anterior corner of each eye. Pronotum with median longitudinal vitta touching posterior margin, in some cases bifid anteriorly, and usual angulate mark back of each eye which reaches at least half way to posterior margin. Scutellum with tip colored, basal angles yellow with dash of orange along outer margin. Clavi with usual basal anchor-shaped spot and rectangular dash before tip. Coria with angulate vitta arising on costa midway between costal plaque and humeral angle and ending at claval suture, another zigzag, irregular-sided vitta arises at anterior end of plaque surrounds it, ending at base of cell M_2 . Black spot in base of cell M_4 and smaller one in posterior end of costal plaque. Cross-veins red. Tips of tegmen more or less dusky. Venter stramineous.

Genitalia. Pygofer hook single, of median length, almost straight with large inner swelling on outer two-thirds, ends in sharp point. Style with medium foot; base almost straight; no heel; practically no points; anterior one short slightly less than right angle; posterior very slight about right angle. Oedagus of medium length, slender, cylindrical with few spines or rough places.

Holotype; male, Bowie Co., Texas, August 8, 1928, R. H. Beamer.

Allotype; female, three male and four female *paratypes*, same data.

This beautiful orange marked species occurs on oak and may be distinguished from all others by the peculiar swollen pygofer hook.

(to be continued)

A SYNOPTIC REVISION OF THE GENERIC CLASSIFICATION OF THE CHELONETHID FAMILY CHELIFERIDAE SIMON. (ARACHNIDA)

BY JOSEPH CONRAD CHAMBERLIN,

Twin Falls, Idaho

(continued from page 294)

DIAGNOSTIC KEY TO THE GENERA OF THE CHELIFERINAE.

Males only.

1. Coxal sac absent2
Coxal sac present3
2. Ramshorn organs of male absent; tergal crests prominent; chelicera with three galeal setae*Ellingsenius* gen. nov. *indicus* sp. nov.
Ramshorn organs present; tergal crests absent or vestigial; chelicera with the usual single galeal seta*Haplochelifera* gen. nov.
3. Coxal sac with well differentiated atrium; statumen convolutum of male genitalia rounded anteriorly.4
Coxal sac without atrium; statumen convolutum of male genitalia anteriorly deeply invaginated and bearing in its center a forward projecting sclerotic "rod"9
4. Chelicera with three distinct galeal setae; tracheal trunks internally puncto-striate*Ellingsenius* gen. nov.
Chelicera with the usual single galeal seta; tracheal trunks evenly striate...5
5. Tergal crests distinctly developed; tarsal claws bifid; subterminal setae dentate; chela gaping6
Tergal crests absent or vestigial; tarsal claws simple; subterminal setae simple or dentate; chela may or may not gape7
6. Tactile seta of tarsus IV conspicuous and sub-median in position; dorsal sclerites and pedipalps smooth and polished; setae simple or denticulo-acuminate*Lissochelifera* gen. nov.
Tactile seta of tarsus IV inconspicuous and sub-terminal in position; dorsal sclerites and pedipalps typically granulate; setae distinctly thickened, sub-clavate or clavate*Tyrannochelifera* gen. nov.
7. Subterminal setae simple*Ectoceras* Stecker
Subterminal setae dentate8
8. Chela gaping; dental margin of movable finger with a distinct, dentate,

- basal or sub-basal crest which fits into a corresponding depression in the fixed finger *Lophodactylus* gen. nov.
- Chela not gaping; without any atypical crests or other modifications of the dental margin of the chela *Hanseni* gen. nov.
9. Tarsal claws simple 10
- Tarsal claws bifid 12
10. Foretarsus with terminal tarsal spine; coxal spurs present; subterminal setae simple or forked 11
- Foretarsus without terminal tarsal spine; subterminal setae simple *Idiochelifer* gen. nov.
11. Subterminal setae simple; statumen convolutum of male genitalia not typical, not markedly invaginated anteriorly *Beierius* gen. nov.
- Subterminal setae dentate; statumen convolutum typical *Hysterochelifer* gen. nov.
12. Foretarsus with prominent terminal spine; sub-basal seta of chelicera present *Parachelifer* gen. nov.
- Foretarsus without terminal spine; sub-basal seta of chelicera absent *Chelifer* Geoffroy

DIAGNOSTIC KEY TO THE GENERA OF THE CHELIFERINAE.

Females only.

1. Tarsal claws bifid; subterminal setae dentate 2
- Tarsal claws simple; subterminal setae simple or dentate 5
2. Tactile seta of tarsus IV conspicuous and sub-medial in position; dorsal sclerites and pedipalps smooth and non-granulate *Lissochelifer* gen. nov.
- Tactile seta of tarsus IV inconspicuous and sub-terminal in position; dorsal sclerites and pedipalps typically granulate 3
3. Median pair of cribriform plates fused into a single central plate (inferred on basis of male structures); included species principally South American *Tyrannochelifer* gen. nov.
- Median pair of cribriform plates separate and distinct 4
4. Sub-basal seta of chelicera present *Parachelifer* gen. nov.
- Sub-basal seta of chelicera absent *Chelifer* Geoffroy
5. Sub-terminal setae simple 6
- Subterminal setae dentate 9
6. Chelicera with three distinct galeal setae *Ellingseni* gen. nov.
- Chelicera with but the usual single galeal seta 7
7. Median cribriform plates fused into a single central plate *Ectoceras* Stecker
- Median cribriform plates separate and distinct 8
8. Median cribriform plates large and conspicuous, sub-equal in length to the diameter of the anterior tracheal trunks *Haplochelifer* gen. nov.
- Cribriform plates typical, much smaller proportionally than in *Haplochelifer* *Idiochelifer* gen. nov.
9. Median cribriform plates fused into a single median plate 10
- Median cribriform plates separate and distinct *Hysterochelifer* gen. nov.
10. Chela gaping; South American genus *Lophodactylus* gen. nov.
- Chela not gaping; African genus *Hanseni* gen. nov.

Cheliferini tribus nov.

Orthotype. The genus *Chelifer* Geoffroy.

Diagnosis. Male: coxal sac entire, lacking a sharply differentiated atrium; statumen convolutum of male genitalia (with a few doubtful and rare exceptions) anteriorly deeply invaginated or retracted and bearing medianally in the depression an anteriorly projecting sclerotic "rod" (see Chamberlin, 1931). Female: median pair cribriform plates separate and distinct.

Remarks. It is almost impossible to differentiate this group except on the basis of the sexual characters noted. Nevertheless it seems to be wholly natural. While the placement of the female is often beset by certain technical difficulties, the male is generally placeable at a glance providing it has been suitably prepared for study.

Chelifer Geoffroy

1762. *Chelifer* Geoffroy.

Genotype. *Acarus cancrroides* Linnaeus. (Linnaeus, 1758.)

Diagnosis and remarks. Discriminated from its segregates in the preceding keys. The generic name *Chelifer* has up until now been employed in such a loose manner and with such a breadth of definition as to render it essentially meaningless as a generic term. In many cases it is equivalent to the superfamily *Cheliferoidea* as herein recognized; in others it is equivalent to the subfamily *Cheliferinae*. As here restricted the number of species certainly referable to the "mother genus" is very few. Bibliographical citations to the genus are omitted as irrelevant to its understanding as at present restricted.

Parachelifer gen. nov.

Orthotype. *Chelifer scabriculus* Simon. (Simon, 1878, p. 154; Chamberlin, 1923, p. 374.)

Diagnosis and remarks. Characterized and differentiated from its allies in the preceding keys.

In addition to the orthotype the genus includes the following species: *Chelifer hubbardi* Banks (Banks, 1901, p. 588; Chamberlin, 1923, p. 374); *Chelifer lativittatus* J. C. Chamberlin (Chamberlin, 1923, p. 375); *Chelifer sini* J. C. Chamberlin (Chamberlin, 1923, p. 374); *Chelifer persimilis* Banks (Banks, 1909, p. 304); and *Chelifer muricatus* Say (Say, 1821, p. 11). This genus seems to be predominantly Western North American.

Idiochelifer gen. nov.

Orthotype. *Chelifer nigripalpus* Ewing. (Originally described as a variety of *cancroides*.) (Ewing, 1911, p. 73.)

Diagnosis and remarks. With the characters indicated in the preceding keys. Ewing's type of the orthotype has been examined through the courtesy of Dr. C. R. Crosby of Cornell University. It is unquestionably not to be associated with *cancroides* as Ewing supposed.

Hysterochelifer gen. nov.

Orthotype. *Chelifer fuscipes* Banks (Banks, 1909, p. 303; Chamberlin, 1923, p. 373.)

Diagnosis and remarks. Characterized and differentiated from its relatives in the preceding keys. In addition to the characters given in the key, the males possess coxal spurs.

In addition to the orthotype the genus includes the following species: *Chelifer geronimoensis* J. C. Chamberlin (Chamberlin, 1923, p. 373); *Chelifer meridionalis* L. Koch (L. Koch, 1873, p. 20); and *Chelifer tuberculatus* Lucas (Lucas, 1845, p. 274). This genus seems likely to be Holarctic.

Haplochelifer gen. nov.

Orthotype. *Chelifer philipi* J. C. Chamberlin. (Chamberlin, 1923, p. 374.)

Diagnosis and remarks. Characterized and discriminated from its relatives in the preceding keys. The orthotype and at present only included species is from California.

Beierius gen. nov.

Orthotype. *Chelifer walliszeki* Ellingsen. (Ellingsen, 1912, p. 101.)

Diagnosis and remarks. Characterized and differentiated from its relatives in the preceding key. The character of the statumen convolutum of the male is like that characteristic of the *Lissocheliferini* but the coxal sac is plainly that of the present tribe. Later studies, especially of the female which has not been available to me, may serve to clarify the, at present, anomalous position held by this genus.

Lissocheliferini tribus nov.

Orthotype. The genus *Lissochelifer* nov.

Diagnosis. Male: Coxal sacs present (1 rare exception known in *Ellingsenius indicus* sp. nov.) and with a sharply differentiated atrium; statumen convolutum of male rounded anteriorly and without the "usual" median anteriorly projecting sclerotic "rod". Female: median pair of cribriform plates fused into a single central plate.

Remarks. Most of the included genera of this tribe are tropical and subtropical as compared with the predominantly temperate and subtropical genera of the *Cheliferini*.

Lissochelifer gen. nov.

Orthotype. *Chelifer mortenseni* With. (With, 1906, p. 140.)

Diagnosis and remarks. Characterized and differentiated from its allies in the preceding keys. It includes a large number of species, principally Malaysian and Polynesian. The following species may be tentatively referred here: *Chelifer depressus* C. Koch, (C. Koch, 1843, p. 57; With, 1906, p. 144); *Chelifer superbus* With (With, 1906, p. 147); *Chelifer bisulcus* Thorell (Thorell, 1889, p. 603; With, 1906, p. 152); and *Chelifer bifissus* Simon (Simon, 1899, p. 121; With, 1905, p. 98.)

Tyrannochelifer gen. nov.

Orthotype. *Chelifer imperator* With. (With, 1908, p. 220.)

Diagnosis and remarks. Characterized and differentiated from its allies in the preceding keys. It apparently also includes *Chelifer macropalpus* Tullgren (Tullgren, 1907, p. 26; With, 1908, p. 221), and *Chelifer floridanus* Banks, (Banks, 1891, p. 162). This genus seems to be primarily South and Central American.

Hansenius gen. nov.

Orthotype. *Chelifer kewi* Ellingsen. (Ellingsen, 1907, p. 162.)

Diagnosis and remarks. Characterized and differentiated from its allies in the preceding keys. In addition to the orthotype it apparently includes

the following species: *Chelifer socotraensis* With (With, 1905, p. 112); *Chelifer disjunctus* L. Koch (L. Koch, 1873, p. 27); and *Chelifer maculatus* L. Koch (L. Koch, 1873, p. 30). The genus seems to range from South Africa to Southern Europe.

Lophodactylus gen. nov.

Orthotype. *Chelifer rex* With (With, 1908, p. 225.)

Diagnosis and remarks. Characterized and differentiated from its relatives in the preceding keys. It is at present known only from the orthotype which is South American. It is closely allied to *Hansenius* under which it may ultimately have to be subsumed.

Ectoceras Stecker

1875. *Ectoceras*. Stecker, p. 516.

1930. (a). *Ectoceras*. Beier, p. 219.

1930. (b). *Ectoceras*. Beier, p. 291.

Genotype. *Ectoceras bidens* Stecker. (Stecker, 1875, p. 518.)

Diagnosis and remarks. Characterized in the preceding keys.

I am somewhat reluctantly following Beier in his recent recognition of *Ectoceras* in connection with the group of species herein associated. I presume that Beier has examined Stecker's types, however, and thus his resuscitation of Stecker's genus is based upon valid considerations. As defined herein the genus includes among others the following species: *Chelifer redikorzevi* Beier (Beier, 1929 (a), p. 35); *Chelifer cephalonicus* Beier (Beier, 1929 (b), p. 448); *Ectoceras corcyrensis* Beier (Beier, 1930 (a), p. 219); and *Chelifer latreilli* Leach (Leach, 1817, p. 49; Kew, 1911, p. 47; Beier, 1930 (b), p. 291).

(to be continued)

TWO NEW SPECIES OF CIXIUS (HOMOPTERA, FULGORIDAE)*

BY G. STUART WALLEY,

Ottawa, Ont.

***Cixius guttulatus* n. sp.**

Length, apex of head to tips of wings 5.75 mm.; width of wing at apex of clavus 1.75 mm.

Vertex broad, transverse, resembling *pini*, median length distinctly less than half as great as width at middle of posterior margin; anterior margin very broadly arcuate, posterior margin scarcely less so. Frons almost twice as long at middle as is clypeus, slightly transversely elevated just before lower margin; greatest width equal to median length. Pronotum with posterior margin slightly obtusely angulate at middle. Mesonotum tricarinate, median carina well defined anteriorly but obsolescent at apex, lateral carinae entire, distinctly divergent posteriorly.

Ground color of head dark brown, carinae yellowish brown, clypeus not distinctly paler than frons. Pronotum brownish with carinae broadly yellowish brown; mesonotum rather dull blackish; sternum blackish brown, coxae and femora brownish, tibiae and tarsi paler brownish. Abdomen blackish, ventral segments narrowly margined with yellowish brown posteriorly and along lateral incisures. Anterior wings pale yellowish hyaline, each with an irregular broad longitudinal brown stripe which extends across base of clavus, thence

*Contribution from the Division of Systematic Entomology, Entomological Branch Dept. of Agric., Ottawa.

along claval suture within. Media, beyond apex of clavus broadened and directed outwardly ending broadly on the costal margin where it encloses a small pale area. Clavus faintly infuscated beyond fork of 2A and 3A; also with the longitudinal band produced inwardly to 3A just before middle of clavus. Posterior wings broadly fuscous at apex, paler along basal two-thirds of costal margin.

Holotype—♀, Pottton Springs, Que., July 4, 1928, (J. A. Adams), No. 3294 in the Canadian National Collection, Ottawa, Ont.

In Metcalfe's key to *Cixius* (Jl. Elisha Mitchell Soc., xxxviii, 161, 1923) this species traces to *coloepium* Fitch. It is easily distinguished by its much broader and shorter vertex, which more nearly resembles *pini* Fitch (fig. 291).

***Cixius umbrosus* n. sp.**

Length, apex of head to tips of wings 7.5 mm.; width of wing at apex of clavus 2.25 mm.

Vertex subquadrate, median length scarcely half as great as width at middle of posterior margin; anterior margin very broadly arcuate, posterior margin more narrowly rounded. Frons slightly longer than clypeus at middle; greatest width slightly more than median length. Pronotum with posterior margin forming a right angle at middle. Mesonotum tricarinate, median carina faint at apex, lateral carinae entire, distinctly divergent posteriorly, slightly angulate at about anterior third.

Ground color of head blackish, front blackish, clypeus and carinae yellowish brown; vertex with a paler spot on either side near posterior angles. Pronotum largely yellowish brown with the darker confined to patches between the carinae. Legs pale brownish, base of coxae, narrow base and broader apex of femora darker brownish; sternum blackish; mesonotum dull blackish, lateral edges behind humeri and at apex of lateral carina faintly yellowish brown lined. Abdomen blackish, ventral segments narrowly margined with yellowish brown posteriorly and along lateral incisures. Anterior wings almost uniformly brown, a small hyaline area at base of costa and the usual darker spot with pale fracture at apex of subcosta. Costal vein with 7 or 8 black points followed by three or four longer dashes, apically. Hind wings brownish, paler at base.

Holotype—♀, Burke's Falls, Ont., July 15, 1926, (F. P. Ide), No. 3295 in the Canadian National Collection, Ottawa, Ont.

In Metcalfe's key (op. cit.) this species traces to couplet 148 but differs from *basalis* Van D. and *pini* Fitch in color and form of vertex and front.

EUROPEAN EXCURSIONS FOR ENTOMOLOGISTS IN 1932

American Entomologists who attend the Fifth International Entomological Congress and the Centenary of the French Entomological Society, in Paris July 16-23, 1932, will doubtless take advantage of the occasion to visit other parts of Europe.

A joint Committee was appointed in December 1930 by the Entomological Society of America and by the Association of Economic Entomologists to arrange for transportation. In addition to providing for those going directly to the Congress, the arrangements of the Committee include two cooperative excursions through Europe at very moderate costs. While intended primarily for entomologists and their families and friends, others, up to certain limits, will be welcome.

Agreements between north Atlantic steamship companies prevent any actual reduction of the rates for ocean transport, but those going in the groups will be given superior accommodations. Furthermore, the Committee will be glad to accord to any one, whether going as a member of one of the groups or independently, the privilege of sharing in very favorable arrangements that have been made covering transportation in Europe and which will amount to a substantial saving of expense. In order to secure such benefit, reservations for ocean transportation should be made through the Committee.

The first group will sail from New York on the Leviathan June 11, visiting (among other places) Copenhagen, the Gota Canal in Sweden, which will be partly traversed on midsummer night when all the village folk hold festival and dance all night in the open air, Stockholm, Upsala, the summer home of Linnaeus at Hammarby, and thence by rail northward to the Swedish National Park in Lappland where a stay of some days will be made on the arctic tundra at Abisko with views of the midnight sun. Those who wish will have time to continue by excursion steamer to the North Cape and back. Returning to the Continent, some days will be spent in Holland and Belgium before going to Paris for the Congress. After that event there will be a week's excursion in the Pyrenees, arranged by the French local committee of the Congress. Then Avignon will be visited, with an excursion to Orange and the home of Fabre at Serignan. Continuing to Grenoble, the party will transverse the Savoyan Alps by motor coach to Argentieres at the foot of Mount Blanc, and after some days continue by motor coach to St. Jeanne de Maurienne, and thence into Italy, where Turin, Genoa, Pisa, Naples, Rome, Assisi, Perugia, Florence, Bologna, and Venice will each be visited. Continuing over the Brenner Pass, a short stay will be made on the Eibsee in the Bavarian Alps, with opportunity to ascend the Zugspitze, Germany's highest peak. Munich, and the three beautifully preserved medieval cities Dinkelsbühl, Rothenburg, and Nuremburg will be visited, Leipzig during the autumn fair, Dresden, the Spreewald, and Berlin. After a final few days in England the party will sail for home September 17 from Southampton. Expenses estimated at about \$800.

The second group will sail from New York on the Olympic July 1, joining the first group in Holland and remaining with them until the Alps. Thereafter they will omit Italy, and make a somewhat swifter tour of Germany, with also a few days in England before sailing, August 27, on the luxurious new liner Manhattan. Expenses about \$550.

Those wishing to go directly to the Congress at the last moment will sail on the Majestic July 8. Estimated expenses including twelve days in Paris about \$325. Combinations of portions of the tours can also be arranged.

These are not conducted tours in the usual sense but are organized for pecuniary benefit to the individuals comprising a group. The members will be free to follow their own inclinations at the stopping places, and in the larger cities in most cases may take their meals at restaurants of their own choosing. While many of the points to be visited have been selected because of their importance as entomological centers, all are full of interest from other points of view for the general traveller.

Estimates are based upon tourist class (former second class) at sea, second class railway, unpretentious but thoroughly comfortable and clean hotels, and inexpensive restaurants, with an allowance for side-trips, incidental and personal expenses. They have been kept as low as possible, consistent with comfort, in order to make the trips available for students of limited means, who may look upon them as part of their educational equipment.

Reservations should be made at the earliest date possible. For circulars and information address:

O. A. Johannsen, Chairman Joint Committee of the Entomological Society of America and Association of Economic Entomologists on Transportation to Europe, Roberts Hall, Ithaca, New York.

BOOK NOTICE

Insect Pests of Farm, Orchard and Garden: By E. Dwight Sanderson; Third Edition, revised and enlarged by Leonard Marion Peairs. New York: John Wiley & Sons, Inc. Price \$4.50 net.

This, the third edition of this most useful publication, dedicated "to the economic entomologists of America," was received in late November, 1931. It is a decided improvement over the previous editions, in size, additional information contained, and general get-up. The fact that this volume has been revised and enlarged and printed for the third time speaks well for the reception it has had among entomologists and others concerned with plant protection work.

In studying the volume, however, we, in Canada, were rather surprised to note the absence of references to important work conducted by Canadian entomologists. This, we feel, is merely an oversight on the part of the authors. We have no hesitation in recommending the purchase of this book by those concerned with insects attacking farm, orchard and garden crops. ARTHUR GIBSON,
DOMINION ENTOMOLOGIST.

er
ll
er
g.
i-
f

-
s,
-
i-
o

s

y
o

;
n

ie
lt
r-
e-
n
k.
d
n
s.
se
n,